HIGH SCHOOL AND UNIVERSITY
MATRICULATION EXAMINATIONS BOARD.

PROMOTION TESTS, 1936.

GEOMETRY 1.

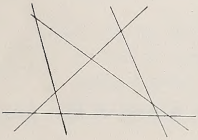
Time—2½ hours.

Values

1. In this question, answers are to be written and constructions are to be made on this sheet in pencil. Enclose this paper in your answer envelope.

Caution: Answers found by measuring will be wrong on account of inaccuracies in these diagrams; therefore do not measure.

4 (*a*)



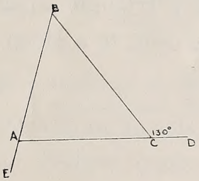
Write S_1, S_2 on two supplementary angles.
Write numbers at the angular points of a polygon.
Shade one triangle and write X on one of its exterior angles.
Write E, E on two equal angles.

1 (*b*) If you face East, then turn to your right through 1½ right angles, you will be facing

....

1 (*c*) Through how many degrees does the minute-hand of a clock turn in five minutes of time? ....

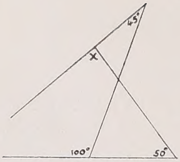
2 (*d*)



If $AB = AC$ and $\angle BCD = 130°$,
$\angle EAC =$ ....°

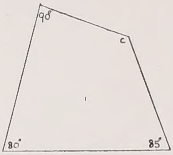
Values

2 (*e*)



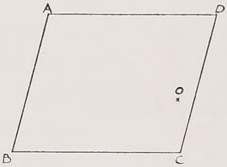
∠x = ...°

2 (*f*)



∠C = ...°

(*g*)

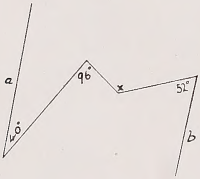


Show construction lines for—

1 (1) bisecting ∠B.

3 (2) drawing through O a line to bisect the parallelogram.

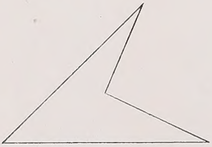
4 (*h*)



Lines a and b are parallel.

∠x = ...°

4 (*i*)



Draw a triangle equal in area to the given figure. Show construction lines.

(*j*) What geometrical facts are used in:

3 (1) Constructing a triangle equal in area, but not congruent, to a given triangle?

....

3 (2) Finding the size of an interior angle of a regular hexagon without measuring?

....

Values

8 **2.** ACB, ADB are two triangles on the same side of AB, with AC = BD and AD = BC. If AD and BC meet in O, prove that the triangles OAB and OCD are isosceles.

8 **3.** To measure the distance AB across a river, a third point C was taken on the same side of the river as A. The following measurements were made:

AC = 1000 feet, angle BAC = 105°, angle ACB = 35°.

By making a diagram (scale 1″ = 400 ft.) find approximately the distance across the river.

9 **4.** If one side of a triangle be greater than another side, the angle opposite the greater side is greater than the angle opposite the less side. (I—10)

8 **5.**

Either If the sides AB, AC of a triangle ABC be produced to D and E, and if the bisectors of the angles BCE, CBD meet in O, show that the perpendiculars from O to BD, BC, CE are all equal.

Or ABC is an isosceles triangle having AB = AC. F and E are the middle points of AB and AC respectively. If BE and CF are joined, prove that angle ABE = angle ACF.

8 **6.** (*a*) Straight lines which join the ends of two equal and parallel straight lines toward the same parts are themselves equal and parallel. (II—6)

6 (*b*) In a quadrilateral ABCD, AD = BC and angle CAD = angle ACB. Prove the quadrilateral is a parallelogram.

8 **7.** (*a*) Divide a given straight line into any number of equal parts. (II—8). (In your figure, use 3 as the number of parts.)

6 (*b*) P is any point in the side AB of a parallelogram ABCD. PC, PD are joined. Prove that △PAD + △PBC = △PDC.

9 **8.** Construct a triangle equal in area to a given rectilineal figure. (Use a five-sided figure.) (II—21)

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